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Date Release Required: 6-27-92

Title: SST Operating Specifications & FIC Operation Procedure

Unclassified Category: UC-

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OPERATING SPECIFICATIONS

for

Facility: SINGLE-SHELL TANKS

Impact Level: 2

Section Title: SINGLE-SHELL TANK PROCESS ENGINEERING

Issued By:
S.D. Godfrey, Manager
Systems Engineering

UNCLASSIFIED

OPERATING SPECIFICATIONS FOR SINGLE-SHELL WASTE STORAGE TANKS

V. C. BOYLES

SINGLE-SHELL TANK PROCESS ENGINEERING

TABLE OF CONTENTS

13.1 INTRODUCTION

Operating Specifications are technical limits and controls imposed on a process or operation which, if violated, could jeopardize the safety of personnel; and could damage equipment, facilities, the environment, and adversely affect product quality.

The Operating Specifications contained in this document apply to single-shell tanks (SSTs) within the 200 East and 200 West Area tank farms (241-A, AX, B, BX, BY, C, S, SX, T, TX, TY, and U tank farms). The SSTs are underground, reinforced concrete, steel lined tanks used for storage of radioactive liquid chemical waste. Configuration requirements also apply to related auxiliary facilities, such as valve pits, diversion boxes, and catch tanks. For a list of all SSTs and related facilities, see the SST Isolation Safety Analysis Report (SAR) SD-WM-SAR-006, Table 5-1.

SSTs are presently inactive with waste storage continuing in these tanks until final disposal plans are approved. Ongoing operations for SSTs include stabilization (via jet and submersible pumping), isolation, and surveillance. Water additions are permitted as necessary for equipment addition/removal, stabilization, and evaporative cooling. Active ventilation is maintained on several tanks to ensure that the waste temperature is maintained below the specification limit.

Criticality prevention specifications for the SSTs and associated tanks are contained in CPS-T-149-00010.

The detailed requirements and the authority for preparing, reviewing, releasing, and revising Operating Specifications are covered in GA-3.7 of WHC-CM-5-5, Operations - General Administration.

Violations of specifications shall be reported immediately to the manager of Tank Farm Operations by the responsible supervisor, and to the managers of Single Shell Tank Process Engineering (SSTPE), Tank Farm Nuclear Safety, and Quality Engineering. In addition, an event Fact Sheet shall be prepared in accordance with WHC-CM-1-3, MRP 5.14.

13.2 OPERATING SPECIFICATIONS

The specifications are divided into four categories: structural limitations, radiological containment requirements, cross connection requirements, and leak detection.

13.2.1 Structural Limitations: The specification limits in this section are set to minimize the structural stresses to which SSTs may be subjected during continued waste storage.

A. Tank Content Composition

No specification is required for composition of existing waste. Specifications below applied when the tanks were active. It is not technically feasible to adjust the composition of existing waste at this time.

Limited water additions are permitted in conjunction with the stabilization program, for equipment addition and removal, for evaporative cooling, and process condensate return.

For any activities that may significantly change the concentration of the contents of a tank, the following restrictions apply to tank contents.

Variable	Specification Limit
1) For NO_3^-	$\leq$ 1.0 M
OH^-	0.01 M $\leq OH^- \leq$ 5.0 M
$NO2^-$	0.011 M $\leq NO2^- \leq$ 5.5 M
2) For 1.0 M < $NO3^-$ $\leq$ 3.0 M	
OH^-	0.1 M ($NO3^-$ Concentration) $\leq OH^- <$ 10 M
$OH^- + NO2^-$	$\leq$ 0.4 M ($NO3^-$ Concentration)
3) For $NO3^-$ > 3.0 M	
OH^-	0.3 M $OH^- <$ 10 M
$OH^- + NO2^-$	$\geq$ 1.2 M
NO3	$\leq$ 5.5 M

Technical Basis: See SD-WM-TI-150, Technical Basis for Waste Tank Corrosion Specifications, pg 9. The nitrite, nitrate, and hydroxide concentrations are limited in order to inhibit corrosion and stress corrosion cracking. If these phenomena are not controlled, deterioration of the primary tank will occur at a faster rate. Failure of these systems may occur if limits are violated.

Detection/Control: See SD-WM-SAR-006, Single Shell Tank Isolation Safety Analysis Report (OSR 11.4.2.2), the requirement of the OSR 11.4.2.2 is that no waste shall be transferred to an isolated facility. SSTs are isolated facilities in that isolation blank nozzle seals are provided to separate the SST from active facilities. Because no waste additions are allowed, tank composition adjustment is not necessary. If the transfer requirement OSR 11.4.2.2 is violated, the transfer shall be halted immediately at the source.

OSR Recovery Action: If tank content concentrations are suspected to be violated by waste transfer into the tank, prohibited by OSR 11.4.2.2, the Tank Farm shift manager shall contact the manager of Tank Farm Operations and SSTPE. SSTPE shall perform all appropriate OSR response requirements. If a liquid transfer is made to a single shell tank, the transfer shall be halted. An engineering evaluation of the impact of the transfer on the tank and corrective action required, if any, shall be performed by SSTPE.

B. Waste Level

Variable	Specification Limit
A, AX, SX	Maximum 360 in.
B, C, T, U (200 series tanks)	Maximum 280 in.
B, BX, C, T, U (100 series tanks)	Maximum 185 in.
BY, S, TX, TY	Maximum 275 in.

Technical Basis: See SD-RE-TI-035, Technical Basis for Single-Shell Tank Operating Specifications, pg 12. Exceeding the above maximum design specifications may result in contaminated overflow into connected lines, if the waste is liquid. There is no minimum waste level for these tanks. However, waste level does affect the vapor space pressure limits and these limits are shown in Section 13.2.1.F.1.

Detection/Control: Each tank is equipped with a waste surface level measuring device (automatic Food Instruments Corp. (FIC) detector, intrusion mode FIC, or manual tape). Automatic FIC readings are transmitted to a substation and then to the Computer Automated Surveillance system (CASS) Control Room in 2750-E Building, on a constant basis. Tanks in which the waste surface is dry are equipped with intrusion mode FICs, which are stationary approximately 1 inch above the waste surface, and alarm immediately at the CASS Control Room if a liquid surface is detected. Readings of manual tapes and some FICS are taken on a periodic schedule specified by SD-WM-TI-357, and are input to the CASS.

Recovery Action: If this specification limit is violated, the manager of Tank Farm Surveillance Analysis & Support shall notify the managers of Tank Farm Operations and SSTPE. The source of the waste level rise shall be determined and the tank addition shall be halted. Pumping of the tank to lower the level below the specification shall begin as soon as practical in accordance with an approved operating procedure.

C. Dome Loading

1. Static Dome Loading (Soil Cover)

Variable	Specification Limit
200 series tanks (20 ft dia)	Minimum 5 ft/Maximum 12 ft
100 series tanks (75 ft dia)	Minimum 5 ft/Maximum 10 ft

Soil cover is depth of soil above the tanks, measured at the center (crown) of the tank dome.

The minimum limit does not apply while a valid excavation permit is in effect.

Technical Basis: See SD-WM-SAR-034, Stabilization of Single-Shell Waste Storage Tank Safety Analysis Report (OSR 11.5.2) and SD-RE-TI-012, Single-Shell Waste Tank Load Sensitivity Study, pg 18. Soil cover is used to provide sufficient radiation shielding for personnel on the soil surface above a tank. The maximum limit is set to prevent structural damage to tank domes.

Detection/Control: Each time the soil cover is disturbed for an excavation, a permit is required. As described in the excavation permit, the excavation area shall be returned to approximately previous grade.

OSR Recovery Action: Should this specification limit be violated, the manager, Tank Farm Operations, shall be responsible for obtaining compliance with this requirement immediately.

2. Dynamic Dome Loading (Live Loads)

Variable	Specification Limit
200 series tanks (20 ft dia)	Maximum 50 tons
100 series tanks (75 ft dia)	Maximum 100 tons

Technical Basis: See SD-WM-SAR-034, Stabilization of Single-Shell Waste Storage Tanks (OSR 11.5.2) and SD-RE-TI-012, Single-Shell Waste Tank Load Sensitivity Study, pg 18. Live load limits are set to prevent structural damage to tank domes.

Detection/Control: Each tank farm containing SSTs is posted with the live load specification limit. The use of loads in excess of those limits requires the SSTPE and Tank Farm Operations manager's approval. In addition, each tank is dome surveyed and monitored per Section 13.2.1.D.

OSR Recovery Action: Should this specification limit be violated, the manager, Tank Farm Operations, shall be responsible for obtaining compliance with this requirement immediately.

D. Dome Deflection

Variable	Specification Limit
1) Deflection Limit (Note: Deflection is defined here as a decrease in elevation measurements from original survey to current one)	Maximum 0.02 ft
2) Surveying	Survey at least every 24± 2 months, except every 12± 1 month for tanks containing dome suspended airlift circulators or when required during jet pumping (see list below for tanks containing dome suspended airlift circulators)

241-AX-101	241-BY-101	241-BY-107	241-SX-102	241-TX-113
241-AX-102	241-BY-103	241-BY-108	241-TX-106	241-TX-114
241-AX-103	241-BY-105	241-BY-110	241-TX-110	241-TX-115
241-AX-104	241-BY-106	241-BY-111	241-TX-111	

3) Bench Marks	A minimum of two bench marks will be maintained on all tanks.
4) Actively Jet Pumping and Net Jet Pump Production <60,000 gallons:	
Last Survey <0.01 ft	Survey every 20,000 ± 5,000 gallons
Last Survey >0.01 ft	Survey every 10,000 ± 2,500 gallons
5) Actively Jet Pumping and Net Jet Pump Production >60,000 gallons:	
All previous surveys <0.01 ft	Survey every 50,000 ± 5,000 gallons
Any previous survey other than Last survey >0.01	Survey every 20,000 ± 5,000 gallons
Last survey >0.01 ft	Survey every 10,000 ± 2,500 gallons

Technical Basis: See SD-WM-SAR-034, Stabilization of Single-Shell Waste Storage Tanks Safety Analysis Report (OSR 11.4.4) and SD-RE-TI-035, Technical Basis for Single-Shell Tank Operating Specifications, pg 4. Dome deflection of greater than 0.02 ft may indicate excessive dome loading or possible structural failure. This phenomenon is expected primarily after jet pumping, since salt cake encrustations on in-tank equipment could load the domes severely when not buoyed by the interstitial liquid removed during jet pumping.

Detection/Control: Surveys are scheduled as above, and Tank Farm Surveillance Analysis & Support (TFSA&S) and SSTPE review survey results. Specific control measures will be formulated on a case-by-case basis, should the maximum deflection limit be exceeded.

D. Dome Deflection (Cont.)

OSR Recovery Action: In the event that the survey frequency or deflection limits are violated, the manager of TFSA&S shall be responsible for seeing that the requirements are satisfied within 30 days of being notified. If the deflection limits are violated, all work shall be stopped and a review shall be performed by SSTPE.

E. Waste Temperatures

Variable	Specification Limit
1) SST Temperatures	Maximum 300° F for waste Maximum 250° for dome Maximum change 20° F per day Lateral temperature maximum - None
2) Thermocouple Trees	Thermocouple trees shall be installed in any SST containing a demonstrated heat load of greater than 40,000 Btu/hr. If two or more probes on a tree fail, operability shall be restored as soon as practical.
3) Temperature Readings	Temperature readings from thermocouple trees shall be recorded at least once every 38 days in tanks required to have thermocouple trees installed (see variable (2) above).

Technical Basis: See SD-WM-SAR-006, Single-Shell Tank Isolation Safety Analysis Report, (OSR 11.4.2.1) and SD-RE-TI-012, Single-Shell Waste Tank Load Sensitivity Study, pg 18. Temperatures and temperature changes in excess of these limits may lead to severe structural stress. The maximum temperature limit is set below the Limiting Condition for operation of 350° F.

Detection/Control: Replaceable thermocouple trees are installed to measure waste temperatures in tanks with a high heat load history. Readings are taken by Tank Farm Operations on frequencies specified by operating procedures. All readings are evaluated by Tank Farm Surveillance Analysis & Support (TFSA&S). Trees in tanks with less than 40,000 Btu/hr heat load are not replaced as they fail, but data is taken for as long as possible.

OSR Recovery Action: If the maximum temperature limit is violated, the shift manager of Tank Farm Surveillance Operations and/or TFSA&S shall notify the managers of Tank Farm Operations and SSTPE. The tank shall be restored to acceptable temperature. Actions may include adjustment of airflows on tanks with active ventilation, and installation of active ventilation on tanks with breather filters. Water may not be added for cooling purposes unless an analysis shows that no dry cooling method will suffice.

F. Vapor Space Pressure

Variable	Specification Limit
1) Pressure	Minimum: 1 in wg.- Waste Height (in. wg) not to exceed -9 in. wg

For example: If a tank contains 8.5 inches of waste, the minimum pressure is -7.5 inches wg.

2) Pressure gauge	A pressure gauge shall be installed at the tank side inlet of each exhauster (an acceptable alternative location is on a tank riser). Pressure is to be recorded at least every 24 hours on actively ventilated tanks.
3) Seal loop	A seal loop, which evacuates at 4±1 in. wg, shall be installed on each passively ventilated tank. The seal fluid shall be nonvolatile, with a specific gravity as close to 1.0 as practical. The liquid level shall be maintained at 4±1 inches, and the seal loop status recorded. Loop fluid levels on passively ventilated tanks shall be checked at least once every 10 days, and refilled if necessary.

Technical Basis: See SD-RE-TI-012, Single-Shell Waste Tank Load Sensitivity Study, pg. 18 and SD-WM-SAR-006, Single-Shell Tank Isolation Safety Analysis Report (OSR 11.4.1.1). Tank vapor space pressures are limited to prevent structural damage due to excess tension or compression. The minimum is set well within the Limiting Condition for operation of -10 in. w.g.

Detection/Control: Experience has shown that inactive SSTs are extremely unlikely to develop the pressure extremes shown above. All SSTs are either equipped with a breather filter/seal loop system or are contained within a ventilation system which pulls a moderate vacuum on each tank. The fans on the three ventilation systems in use cannot pull a tank vacuum of more than 7 in. wg. The tank pressures within each ventilation system are monitored every two weeks. Tank pressures are not routinely monitored on passively ventilated tanks, but the seal loops provide a physical check of the pressure range the tank has experienced.

OSR Recovery Action: If this specification limit is violated, the system shall be restored within one shift to within the requirement. The Tank Farms shift manager shall contact the managers of Tank Farm Operations and SSTPE. Immediate recovery actions may include adjustment of the air-inleakage to actively ventilated tanks under the direction of the Tank Farms shift manager.

G. Active Ventilation

Variable	Specification Limit
1) Temperature Date	SSTPE and TFSA&S shall review periodic SST temperature data at least every 3 months. SSTPE shall notify the manager, Tank Farm Operations, of any change required. Peak temperatures shall be predicted for any tank showing a rising temperature trend.
2) Active Ventilation	Active ventilation shall be installed for cooling any SST which: 1) is expected to reach a peak high temperature which exceeds the maximum operating specification (see 13.2.1.E or 2) contains waste projected to boil.

Technical Basis: See SD-RE-TI-012, Single-Shell Waste Tank Loading Sensitivity, pg 18 and SD-WM-SAR-006, Isolation of Single-Shell Waste Storage Tank Safety Analysis Report, (OSR 11.4.2.1). If a tank reaches the maximum temperature, structural stresses may become excessive. Vapor will be formed in tank wastes boil, and must be exhausted to cool that tank. The analysis interval is set at the limiting condition for operation.

Detection/Control: Replaceable thermocouple trees are installed to measure waste temperatures in tanks with a high heat load history. A simulation has been used to predict final temperature peaks for SSTs which have not cooled, and tanks predicted to peak at above specification maximums are currently equipped with exhauster systems.

OSR Recovery Action: The manager, Tank Farm Operations, shall be responsible for commencing active ventilation operation within the time determined by SSTPE.

13.2.2 RADIOLOGICAL CONTAINMENT REQUIREMENTS

The specification limits in this section are set to minimize any release of radionuclides to the atmosphere.

A. Liquid Effluents Concentration

There are no radioactive liquid effluent streams from SSTs.

B. Gaseous Effluents Concentrations

Note: Release of nonradioactive hazardous constituents to the environment (via tank exhausts) is also a concern that is being reviewed. The requirements for control of these materials are contained in:

1. WHC-CM-5-16, Section 9, Hazardous Waste Management
2. WHC-CM-7-5 Envir. Compliance Manual, Part B
3. WHC-CM-4-1 Emergency Plan

A vapor space sampling program is being formulated for both single shell and double shell tanks. The information from this program will be utilized to determine future controls for hazardous releases.

Variable	Specification Limit
1) Annual Average Concentration	The annual average concentration of radionuclides released to the environment, in airborne effluents shall not exceed the derived concentration guides specified in Appendix A, WHC-CM-7-5.
2) Weekly Average Concentration	The two week average concentration of radionuclides released to the environment, in airborne effluents, shall not exceed four times the derived concentration guides specified in Appendix A, WHC-CM-7-5.
3) Maximum Instantaneous Concentration	The maximum instantaneous concentration of radionuclides released to the environment in airborne effluents shall not exceed 5000 times the derived concentration guides specified in Appendix A, WHC-CM-7-5.
4) Functional Testing	Monitors and alarms for active exhaust stacks shall be functionally tested on a monthly frequency not to exceed 45 days.

Technical Basis: See WHC-CM-7-5, Environmental Compliance Manual, Part D and Appendix A and DOE Order 5480.1B Chapter XI. Gaseous effluents in excess of the above specifications could jeopardize the safety of facilities, or the environment.

Detection/Control: Active ventilation systems are equipped with continuous air monitors (CAMs) and record samplers. CAMs are interlocked to shutdown the ventilation fan when radionuclides exceed the high level setpoint. Record samples are collected continuously and analyzed weekly for gross beta/gamma and alpha.

Recovery Action: If the specification limits are violated, the Tank Farm shift manager shall notify the managers of Tank Farm Operations, SSTPE, Tank Farm Plant Engineering (TFPE), and Health Physics. If the required monitoring and sampling is inoperable for more than 24 hours, the exhauster shall be shutdown and all risers to the affected tanks sealed according to 13.2.2.D.1.

C. Ventilation Operating Pressures

Variable	Specification Limit
Ventilation Operating Pressure	Maximum: -0.1 in wg Minimum: -5.9 in wg

Technical Basis: See SD-RE-TI-035, Technical Basis for Single-Shell Tank Operating Specifications, p. 18. Filter failure will be indicated by alarm on the continuous air monitor.

Detection/Control: The active ventilation systems are equipped with pressure sensors. Pressures in some tanks are measured periodically during psychrometric measurements of each ventilation system.

Limiting Control Setting Recovery Action: If this specification limit is violated, the system shall be restored within one shift to within the requirement. The Tank Farm shift manager shall contact the managers of Tank Farm Operations and SSTPE. Immediate recovery actions may include an adjustment of the air-inleakage to actively ventilated tanks under the direction of the shift manager where provisions have been made for variable inflow.

D. Active Ventilation Shutdowns

Variable	Specification Limit
1) Tank Riser & Pit Seals	All tank risers and pits except the exhauster connections shall be sealed prior to any planned shutdown. Health Physics Technician (HPT) shall be notified prior to any planned shutdown.
2) Shutdown Time	SSTPE shall determine the maximum time that any tank in an active ventilation system can have the ventilation system off the line on a case-by-case basis. During this shutdown time, the passive HEPA breather filters shall be operating.

Technical Basis: See SD-WM-SAR-006, Single-Shell Tank Isolation Safety Analysis Report, Table A-3 (OSR 11.4.1.1, 11.4.2.1), and WHC-CM-7-5, Environmental Compliance Manual, Part D.

Detection/Control: The operating procedures contain instructions to check all tanks within a system before shutting down an exhauster.

OSR Recovery Action: The manager Tank Farm Operations shall be responsible for monitoring the tank seals and for commencing active ventilation within the maximum time determined by SSTPE. Notify HPT of the miscommunication and provide documented evidence that the seals have been properly checked.

E. Gaseous Effluent Filtration

Variable	Specification Limit
1) HEPA Filter Stages	All tanks on active ventilators shall have two stages of High Efficiency Particulate Air (HEPA) filtration in the outlet stream. Air inlets for active ventilation systems shall be HEPA filtered.
2) Passive Ventilation	All SSTs shall be passively ventilated using HEPA breather filters even if active ventilation is temporarily installed.

Technical Basis: See SD-WM-SAR-006, Single-Shell Tank Isolation Safety Analysis Report, Chapter 9 and WHC-CM-7-5. Environmental Compliance Manual, Part D. The HEPA filtration of gaseous effluents is intended to minimize the release of radioactive contaminants to the atmosphere.

Detection/Control: Changes in tank equipment are approved by the SSTPE cognizant engineer. Loss of filtration in active ventilation systems is indicated by failure of dioctylphthalate (DOP) testing, and may be indicated by the continuous air monitors, which causes the ventilator to shut down and an alarm to the CASS. Loss of filtration on passively ventilated SSTs is indicated during DOP testing.

Recovery Action: In the event of active ventilation HEPA failure, two stages of HEPA filtration shall be restored by replacement of filters, switching to an alternate system, or the ventilation shall be shut down to change the filters. One of these three actions shall occur within three days of notification to the manager of Tank Farm Operations.

In the event a breather filter fails a DOP test, HEPA filtration shall be restored by filter replacement within 7 working days of the test. The filter shall continue in service during the 7-day period unless the test efficiency is less than 90%. If the test efficiency is less than 90%, the isolation valve shall be closed to separate the filter from the SST and the seal loop must be observed daily until the filter is replaced and the valve is reopened.

F. Filter Differential Pressure

Variable	Specification Limit
1) First filter in a series	Maximum 5.9 in. wg Minimum 0.05 in. wg
2) Other filter in a series	Maximum 4.0 in. wg Minimum 0.05 in. wg
3) Total series of filters	Maximum 5.9 in. wg Minimum 0.05 in. wg

Differential pressure is defined as the drop in pressure from the inlet to outlet of a filter (or series of filters).

Technical Basis: See SD-RE-TI-035, Technical Basis for Single-Shell Tank Operating Specifications, p. 18. Differential pressure across a HEPA filter outside the operating range may indicate failure. This would potentially allow release of contamination to the environment.

Detection/Control: All active ventilation systems used with SSTs are equipped with differential pressure sensors between each filter and across the filter set. Alarms signal if differential pressure is outside the operating range, and each exhauster is interlocked to shut down if the overall differential pressure is too high, or if the final stage differential pressure is too low.

Recovery Action: If the pressure drop across a filter or across filters in a series should exceed the maximum specification limit, then the filter(s) shall be replaced within the time frame specified per Section 13.2.2.E.

G. HEPA Filter Temperature

Variable	Specification Limit
Filter temperature	Maximum: 200° F

Technical Basis: See ASME N509-1989, Nuclear Power Plant Air Cleaning Units and Components, Section 5.1.1, p. 17. Filters exposed to temperatures greater than 200° F shall have steel sides. HEPA filters presently used in single shell tank farms have wooden sides. Excessive temperatures in the air stream around a HEPA filter can lead to filter failure. This would allow potentially contaminated releases to the atmosphere.

Detection Control: Temperature sensors and controllers are installed on each exhauster serving SSTs. Controls shut off the heaters at a set temperature. An alarm sounds if the high temperature operating limit is reached.

Recovery Action: If the specification is violated, DOP testing of the filters shall be scheduled within 24 hours or the next earliest weekday. Prior to any work OHP shall evaluate the radiological condition of the filters. If the filter(s) fail the DOP test, filter replacement per section 13.2.2.E applies.

H. HEPA Filter Testing and Efficiency

Variable	Specification Limit
1) Efficiency	Minimum 99.95% for 0.3 um particles
2) Testing Frequency	The following conditions shall require that the filter system be DOP tested: (1) system is new (2) system is moved (3) filter(s) replaced (4) system has been off over 60 days (5) every 12 ± 1 month during use (may be tested more often)
3) Replacement	HEPA filters shall be replaced at no longer than five year intervals.

Technical Basis: See WHC-CM-7-5, Environmental Compliance Manual. Filters which allow excessive particles to pass may release contamination to the atmosphere. Dioctylphthalate testing is the accepted means of measuring how many particles pass through filters. High efficiency particulate air filters have a finite storage life, and the replacement requirement assures that deteriorated filters are not used.

Detection/Control: Filters are tested as specified above. Replacement of filter systems is directed by Tank Farm Operations, as necessary. Records are maintained by SSTPE.

Recovery Action: If the testing frequency limit is violated, DOP testing of the filters shall be scheduled within 24 hours of discovery of the violation or the next earliest weekday. If the filter(s) fail the DOP test, filter replacement per section 13.2.2.E applies.

13.2.3 CROSS-CONNECTION REQUIREMENTS

A. Process Transfers

Specification

At no time shall waste be added to an SST.

Process condensate from tanks on active ventilation is not considered to be a waste or water addition, and therefore, can be returned to one of the tanks on the ventilation system per SD-WM-SAR-006, paragraph 7.5.

Raw water additions controlled by Section 13.2.3.B are specifically excluded from this specification.

Technical Basis: See SD-WM-SAR-006, Single-Shell Tank Isolation Safety Analysis Report, (OSR 11.4.2.2). Any addition of liquid to a single-shell tank could aggravate a potential release of radionuclides in the event of a tank leak.

Detection/Control: Each SST is equipped with a waste surface level sensor which are checked periodically in accordance with approved operating procedures. All routes between active facilities and SSTs are now disconnected. See Section 13.2.3.C for configuration control.

OSR Recovery Action: If the transfer requirement OSR 11.4.2.2 is violated, the transfer shall be halted immediately at the source. The Tank Farms shift manager shall notify the managers of Tank Farm Operations and SSTPE. All transfers in the vicinity of the interim isolated facility shall be halted until a recovery plan is in place. The managers of Tank Farm Operations and SSTPE shall establish a recovery plan to ensure that the facility is again isolated, and to evaluate the probable effects if a transfer has occurred.

B. Water Additions

Variable	Specification Limit
1. Water amount allowed each addition	
SST equipped with jet pump or to be installed within 90 days.	Up to 500 gallons per activity with approval of TFO shift manager
	Larger additions require approval of SSTPE and TFO management
All other SSTs except C105 and C106	All additions shall be approved by SSTPE and TFO management
Tanks C105 and C106	As necessary, with approval of TFS&O shift manager

Technical Basis: See SD-RE-TI-035, Technical Basis for Single-Shell Tank Operating Specifications, pg. 19. Free liquid within an SST can aggravate the release to the environment should a tank leak occur. Water additions should be avoided in order to minimize free liquid in the SST.

Detection/Control: Water meters are used during all additions and the change in the receiving tank level is used as a check where appropriate. Administrative controls are in place as specified above.

Recovery Action: If this specification limit is violated, the Tank Farms shift manager shall immediately stop the water addition at the source. The Tank Farms shift manager shall notify the managers of Tank Farm Operations and SSTPE. An investigation will be conducted by SSTPE to determine the cause of the deviation.

C. Configuration Control

This specification applies to interim isolated SSTs and auxiliary facilities, and to the equipment which has undergone isolation on partially isolated SSTs. See list in SD-WM-SAR-006, Table 5-1.

Configuration control is defined here as the physical state of an SST and its related equipment and auxiliary facilities. This includes sealing of risers, pits and nozzle seals (isolation blanks), shielding, utilities, etc.

1. Any job which disturbs an SST or auxiliary facility configuration, in such a way as to violate the criteria for interim isolation, shall include restoration of the configuration to fall within the interim isolation criteria.

2. Where a sealed nozzle in an interim isolated SST or auxiliary facility provides a direct connection to an active facility, the isolation blank may not be removed.

Technical Basis: See SD-WM-SAR-006, Single-Shell Tank Isolation Safety Analysis Report, (OSR 11.4.2.2). Disturbance of the configuration of an isolated SST could allow release of contamination or could reconnect the isolated SST to an active facility. This is undesirable, since a potential release in the event of a tank leak could be aggravated.

Detection/control: Routine jobs are controlled via procedure. Work orders are used for all non-routine jobs. The observation port is intended to be the usual place of entry for an SST. An Engineering Change Notice is written against the tank configuration drawing for any changes. Isolation blanks are painted red (unless an existing blank remains), and are designated on routing boards in red.

OSR Recovery Action: If the transfer requirement OSR 11.4.2.2 is violated, the transfer shall be halted immediately at the source. If the nozzle seal requirement is violated, the seal shall be replaced as soon as possible consistent with good radiological practice. The Tank Farms shift manager shall notify the managers of Tank Farm Operations and SSTPE. All transfers in the vicinity of the interim isolated facility shall be halted until a recovery plan is in place. The managers of Tank Farm Operations and SSTPE shall establish a recovery plan to ensure that the facility is again isolated, and to evaluate the probable effects if a transfer has occurred as well as to prescribe actions to prevent future occurrences.

13.2.4 LEAK DETECTION CONTROL

This specification applies to all SSTs involved in saltwell jet or supernatant pumping.

A. Transfer Leak Detection Control

Variable	Specification Limit
1) Area Radiation Monitors	Area Radiation Monitors (ARMs) shall be used to help detect leaks from saltwell transfer lines.
2) Portable ARMs	Portable ARMs should be used in areas where berms or depressions may prevent the fixed detectors from detecting a leak.
3) Distance	The detectors must be place within 180 ft, and in line of sight, of any potential radioactive spill.

Technical Basis: See WHC-CM-7-5, Environmental Compliance Manual. Without line of sight detection, a radioactive spill, no matter how large or concentrated, would not be seen by a detector.

Detection/Control: ARMs are located throughout the tank farms. Portable ARMs are available to be used as necessary.

Recovery Action: In the event it is determined that an operable area radiation monitoring system is not in place for all of the applicable tank farms, affected operations of the facility shall be halted as soon as safely possible. The managers of SSTPE and Tank Farm Operations shall be notified immediately. The affected operations shall remain shut down until an operable area radiation monitor is in place.

B. Drywell Leak Detection Control

During interim stabilization, liquid removal and immobilization activities reduce the drainable liquid (both supernatant and interstitial) to the extent practicable. When the tanks are interim stabilized, each may contain a heel of up to approximately 30,000 gallons of drainable liquid. An increase of radioactivity in the leak detection wells could indicate that liquid is leaking from the tank.

Technical Bases: RHO-ST-34, "A Scientific Basis for Establishing Drywell Monitoring Frequencies, and SD-WM-SAR-034, Stabilization of Single Shell Waste Storage Tanks Safety Analysis Report (OSR 11.4.3). Tank leakage may be observed by an increase of the radiation level in the drywell.

Detection/Control: Drywells are monitored on a periodic basis set by WHC-SD-TI-357. The drywells are located around the Single Shell Tanks so that if liquid leaks from a waste tank it will be detected during the review of the drywell scan plots.

OSR Recovery Action

In the event the monitoring figuring is violated, the manager of TFSA&S shall notify the managers of TFO and SSTPE immediately. The manager of TFO has the responsibility to assure that the required monitoring is completed within 30 days of discovery of the violation.

APPENDIX A

SAFETY BASED SPECIFICATION TRACEABILITY MATRIX

SOURCE	OPERATING SPECIFICATIONS	IMPLEMENTING PROCEDURE	RECORD OR DOCUMENTATION
SD-WM-TI-150 OSR 11.4.2.2 of SD-WM-SAR-006	13.2.1.A Tank Content Composition	TO-080-030	Sample Analysis
SD-RE-TI-035 SD-WM-TI-357	13.2.1.B Waste Level	TO-040-020 TO-040-180 TO-040-200	Tank Farm Liquid Level Data Sheets
OSR 11.5.2 of SD-WM-SAR-034 SD-RE-TI-012	13.2.1.C.1 Static Dome Loading	None	Excavation Permits
	13.2.1.C.2 Dynamic Dome Loading	TO-020-250 TO-020-270	None
OSR 11.4.4 of SD-WM-SAR-034 SD-RE-TI-035	13.2.1.D Dome Deflection	None	Survey Results
	Survey Limit	None	Survey Results
OSR 11.4.2.1 of SD-WM-SAR-006 SD-RE-TI-012	13.2.1.E Waste Temperatures	TO-040-020 TO-040-025 TO-040-650	Tank Temp Data Sheets
OSR 11.4.1.1 of SD-WM-SAR-006 SD-RE-TI-012	13.2.1.F Vapor Space Pressure	TO-040-020 TO-060-015 TO-060-035 TO-060-050 TO-060-330 TO-400-120	Ventilation Data Sheets, Loop Seal Data Sheets
OSR 11.4.2.1 of SD-WM-SAR-006 SD-RE-TI-012	13.2.1.G Active Ventilation	TO-060-035 TO-060-050 TO-060-330 TO-400-120	Ventilation Data Sheets

APPENDIX A (Cont'd)

SOURCE	OPERATING SPECIFICATIONS	IMPLEMENTING PROCEDURE	RECORD OR DOCUMENTATION
WHC-CM-7-5 DOE Order 5480.1B	13.2.2.A Liquid Effluents Concentration	None	None
WHC-CM-7-5 DOE Order 5480.1B	13.2.2.B Gaseous Effluents Concentration	WHC-CM-4-12/ Practice 7.3 WHC-CM-4-13 5.2.2.6 5.2.2.7	Inspection Data Sheets Sample Analysis
OSR 11.4.1.1 of SD-WM-SAR-006 SD-RE-TI-035	13.2.2.C Ventilation Operating Pressure	TO-060-035 TO-060-050 TO-060-035 TO-400-120	Ventilation Data Sheets
WHC-CM-7-5 Appendix A OSR 11.4.1.1, 11.4.2.1 of SD-WM-SAR-006	13.2.2.D Active Ventilation Shutdowns	TO-060-035 TO-060-050 TO-060-330 TO-400-120	Ventilation Data Sheets
Chapter 9 of SD-WM-SAR-006 WHC-CM-7-5	13.2.2.E Gaseous Effluent Filtration	TO-060-015 TO-060-035 TO-060-050 TO-060-330 TO-400-120	Ventilation Data Sheets Loop Seal Data Sheets
SD-RE-TI-035	13.2.2.F Filter Differential Pressure	TO-060-035 TO-060-050 TO-060-330 TO-400-120	Ventilation Data Sheets

APPENDIX A (Cont'd)

SOURCE	OPERATING SPECIFICATIONS	IMPLEMENTING PROCEDURE	RECORD OR DOCUMENTATION
Section 5.1.1 of ASME N509-1989	13.2.2.G HEPA Filter Temperature	TO-060-035 TO-060-050 TO-060-330 TO-400-120	Ventilation Data Sheets
WHC-CM-7-5	13.2.2.H HEPA Filter Testing and Efficiency	TO-060-015 TO-060-035 TO-060-050 TO-060-070 TO-060-330 TO-400-120	Maintenance Records Filter Change Data Sheets
OSR 11.4.2.2 of SD-WM-SAR-006	13.2.3.A Process Transfers	TO-025-001	Tank Waste Transfer Data Sheets
SD-RE-TI-035	13.2.3.B Water Additions	TO-040-540 TO-350-200	Raw Water Usage Data Sheets
OSR 11.4.2.2 of SD-WM-SAR-006	13.2.3.C Configuration Control	TO-025-001	Tank Farm Routing Board
WHC-CM-7-5	13.2.4.A Transfer Leak Detection Control	TO-020-190 TO-020-200 TO-020-210 TO-020-220 TO-025-001 TO-321-710 TO-410-858 TO-410-859	Tank Waste Transfer Data Sheets
OSR 11.4.3 of SD-WM-SAR-034 WHC-SD-WM-TI-357	13.2.4.B Drywell Leak Detection Control	TO-040-330	Tank Farm Drywell Monitoring Log

OPERATE FIC'S AT EAST/WEST TANK FARMS

I. SYSTEM DESCRIPTION

This procedure provides instructions for reading and reporting the three operational modes of the Food Instrument Corporation (FIC) gauges. One hundred and nine (109) waste storage and catch tanks in the East area and West area Tank Farms are equipped with FICs. The associated equipment for these systems consists of a plummet suspended on a steel tape, tape reel, sight glass, control switch, and ports for air purge and water flush. The FICs are mounted on designated tank risers. The control systems automatically adjust the tape position so that the plummet repeatedly makes and breaks contact with the waste surface. The one exception are those FICs which have been placed in an INTRUSION MODE of operation. In Intrusion Mode, the plummet remains suspended at a fixed position above the solid waste surface.

The plummet reference position is in the sight glass. The counter is set (by Tank Farm Instrument Maintenance) when the plummet is at the reference position. The air purge minimizes vapor condensation on the tape take-up and sprocket wheels, refer to FIGURE 1.

Each FIC is set to one of the following modes of operation:

- Manual: Read in the Field - Measures tank liquid level using a conductive sensor connected to a steel tape, tape reel, sight glass and electronic control box with a decimal display (xxxxx inches) referenced to the bottom of the tank. Readings are taken in the field and then input into CASS. This system is also referred to as a Manual FIC.

- Automatic: Read by CASS - An FIC similar to that described above, except that it has been modified so that CASS can automatically read the level display and perform some diagnostics and controls. The system is referred to as an Automatic FIC.

- Intrusion FIC: - An FIC which has been modified to allow operation in the intrusion mode. The plummet remains at a preset level, and the occurrence of an intrusion to that level is sensed by CASS. This system is referred to as an Intrusion FIC (IN).

Manual FICs that are read in the field and whose readings are manually input into CASS, are not to be confused with manual tapes.

OFFICIALLY RELEASED FD

I. SYSTEM DESCRIPTION (Cont.)

Reports on the FICs may be obtained from CASS and printed out at 272-AW, 242-A, 242-S, and the Control Printer at 2750-E, or displayed on the CRT at 2750-E.

Additional instructions are included to clear errors that could take place with the Robertshaw LIT Model 185A.

II. REFERENCE DOCUMENTS

None

III. PRESTART CONDITION

None

IV. SAFETY

Warning - Do not touch the electronic circuitry within the FIC control boxes, to prevent potential damage to the equipment and injury to personnel.

OPERATIONAL SAFETY REQUIREMENTS (OSR)

General Recovery Action - If any Specification Limit in this procedure is violated, immediately notify supervision of the condition, unless a specific Recovery Action is stated with the limit.

SD-HS-SAR-010, AGING WASTE SAR

OSR 11.13 MAXIMUM LIQUID LEVEL

Requirement - The maximum liquid or froth level in 241-AY and AZ tanks shall be less than 370 in.

SD-WM-SAR-016, DOUBLE SHELL TANKS OPERATIONAL SAFETY REQUIREMENTS

OSR 11.5 PRIMARY TANK MINIMUM LIQUID LEVEL

Requirement - The ventilation system shall not be operated unless the liquid level is 6 inches or greater. (241-SY, AN, AW, and AP tanks)

IV. SAFETY (Cont.)

Applicable Safety Documents - Provisions of Radiation Protection Manual, WHC-CM-4-10; Radiation Work Requirements and Permits Manual, WHC-CM-4-15, Vol. 2; Industrial Safety Manual, WHC-CM-4-3, Vols 1-3; Building Emergency Plan, WHC-IP-0263; and Tank Farm Safety Rules apply to all work performed under this procedure.

Applicable Safety Limits - SD-HS-SAR-010, *Aging Waste SAR*; SD-WM-SAR-016, *Double Shell Tanks Operational Safety Requirements*.

V. TOOLS AND SUPPLIES

TANK FARM LIQUID LEVEL DATA SHEETS
SD-WM-TI-357, WASTE STORAGE TANK STATUS AND LEAK DETECTION CRITERIA
TO-040-020, OPERATING PROCEDURE: CASS TERMINALS
TO-020-420, CLEANING AND DECONTAMINATION OF FIC PLUMMET

VI. TABLE OF CONTENTS

VII. PROCEDURE

A. OPERATE AUTOMATIC LIQUID LEVEL FIC

NOTE - Surface level readings shall be taken at the frequencies stated in SD-WM-TI-357, or at frequencies specified by supervision. FICs which are currently being monitored by CASS will be read by CASS. FICs which are not currently being monitored by CASS are to be read in the field and the readings manually input into CASS. When CASS is not operational, or when individual Automatic/Intrusion FICs cannot be read by CASS, manual field readings are required. A listing of tanks equipped with FICs can be obtained per TO-040-020.

- The air purge can be off after an air failure during holidays or weekends at management discretion. It must, however, be repaired and turned on as soon as possible on the next normal working day. The air may be off for an extended period during freezing weather due to frozen air supply lines.

1. IF instructed by supervision, PLACE the automatic FICs, which have been modified for intrusion mode service, into intrusion mode.

NOTE - USE a separate DATA SHEET per TO-040-200 for each farm when airflow is checked.

2. CHECK air purge flow every Monday.

   a. SET the air purge to flow from 25 to 50 cfh or .4 to .8 cfm.

   b. INSPECT rotometer sight glass for evidence of foreign material (oil, water, etc.).

   c. IF foreign material is observed, RECORD the fact on the DATA SHEET per TO-040-200.

NOTE - Refer to TABLE 1, page 5, Condition 1 for switch position during normal operation.

- Switch S-1, when turned ON starts the unit, and turns on the pilot light.

- Switch S-1, when turned OFF stops the unit, the pilot light goes out, and the plummet maintains position.

3. RAISE and LOWER plummet per TABLE 1, page 5, conditions 2 & 3.

4. DEPRESS button S-4 when S-2 is in OFF to make the plummet break and re-establish surface contact (refer to TABLE 1, page 5, Condition 4).

A. OPERATE AUTOMATIC LIQUID LEVEL FIC (Cont.)

5. DEPRESS button S-4 when S-2 is at MANUAL-RISE to raise the plummet (Refer to TABLE 1, page 5, Condition 5.

WARNING

If electrical switch S-1 is not turned off as soon as the plummet reaches the stop, personnel injury and damage to the plummet could result.

NOTE - The plummet motion will be blocked on rising into the reel housing by a mechanical stop and will be stopped on lowering when liquid or any other electrical conductor to the tank is contacted

6. WHEN plummet reaches mechanical stop, TURN switch S-1 to OFF.

7. IF access to the control box is not needed, MAINTAIN screw latches tight.

NOTE - An alarm message will appear at CASS terminals when the aging waste tank FIC's are put into the MANUAL mode. FIC IN (Tank ID) IN MANUAL RISE mode.

8. IF the above alarm occurs, NOTIFY supervision immediately.

TABLE 1: SWITCH POSITIONS FOR AUTOMATIC LIQUID LEVEL MODE FIC'S

NOTE - FICs not connected to CASS have only switches S-1 and S-2.

CONDITION	ON-OFF (S-1)	POSITION (S-2)	MODE (S-3)	COMPUTER-BOB BUTTON (S-4)
1. Normal Operation.	ON	OFF	COMPUTER	N/A
2. Raise Plummet.	ON	MAN-RISE	MANUAL	N/A
3. Lower Plummet.	ON	OFF	MANUAL	N/A
4. Plummet breaks and re-establishes surface level contact.	ON	OFF	COMPUTER	Depressed
5. Plummet will immediately rise.	ON	MAN-RISE	MANUAL	Depressed

B. OPERATE INTRUSION MODE FIC

1. CHECK air purge flow every Monday.

   a. ENSURE the air purge flows from 25 to 50 cfh.

   b. INSPECT the rotometer sight glass for evidence of foreign material (oil, water, etc.).

   c. IF such material is observed, RECORD the fact on the level DATA SHEET.

NOTE - During the off shift or weekends Tank Farm Surveillance & Analysis (TFSA) is to be contacted at the beginning of the next regular day shift.

2. IF requested to place an FIC in intrusion mode, CONTACT TFSA to have them change the FIC to intrusion mode and set the baseline per the baseline listed on option 32 or 33 in CASS.

NOTE - TABLE 2, page 12, condition 1 lists switch position during normal intrusion mode operation.

3. VERIFY that mode and baseline changes have been made.

4. PLACE plummet at the baseline elevation.

5. PERFORM the following for plummet elevation changes:

   a. PLACE COMPUTER-MANUAL switch in MANUAL position.

   b. PLACE OFF-MANRISE switch in MANRISE position.

   c. PLACE INTRUSION-LIQUID LEVEL switch in LIQUID LEVEL position.

NOTE - The plummet will begin to rise after about a 1 minute delay. The delay can be eliminated by depressing the S-4 switch.

   d. WHEN the plummet is above the baseline elevation, POSITION the OFF-MANRISE switch to OFF.

NOTE - The plummet will begin to move downward.

   e. STOP the plummet at the baseline elevation by positioning the INTRUSION-LIQUID LEVEL switch to INTRUSION.

B. OPERATE INTRUSION MODE FIC (Cont.)

NOTE - Refer to FIGURE 2, page 21, for switch location.

6. REFER to the following for switch positions for normal intrusion mode:

Switch	Position
POWER	ON
OFF-MANRISE	OFF
COMPUTER-MANUAL	MANUAL
INTRUSION-LIQUID LEVEL	INTRUSION

7. ENSURE plummet is at baseline elevation and the tenths digit is not between numbers.

8. CHECK surface level readings on Intrusion FIC's by performing the following:

   a. MANUALLY measure the tank waste level at the frequency stated in SD-WM-TI-357, OR per supervision instruction.

   b. READ surface level by placing the switches in the correct position, REFER to step 6 above.

NOTE - When the INTRUSION-LIQUID LEVEL switch is placed in the LIQUID LEVEL position, the plummet will move downward immediately. The downward movement will stop when conductivity is established.

- If the plummet is contacting liquid, the plummet will not move downward, but will move upward until contact with the liquid is broken.

   c. AFTER the waste level has been measured, PLACE the FIC back into the intrusion mode.

   d. PLACE the plummet at the baseline elevation.

   e. RETURN all switches to the normal intrusion position.

C. RESPOND TO INTRUSION ALARMS

Alarm: LEVEL DIFFERS FROM BASELINE

NOTE - CASS will notify supervision that the message was received and a field check will be necessary of the FIC as soon as possible.

- There are a number of incorrect switch positions which may cause this alarm.

1. CHECK switch positions per TABLE 2, page 12, condition 1.

2. IF an error is found, PERFORM the following:

   a. SET plummet at baseline elevation.

   b. RETURN all switches to normal intrusion position per TABLE 2, page 12, condition 1.

3. REQUEST an OPTION 30 from the CASS operator. The response must be:

   IN. LIQUID LEVEL FOR TANK (ID) IS XXX.XX inches (date)(time)

NOTE - The FIC has been placed in automatic liquid level mode when COMPUTER-MANUAL switch is positioned to COMPUTER and the INTRUSION-LIQUID LEVEL switch is positioned to LIQUID LEVEL.

4. IF the FIC continues to send the LEVEL DIFFERS FROM BASELINE message, PLACE it in the automatic liquid level mode.

5. CONTACT TFSA AND

   REQUEST that the mode and baseline of the FIC be changed to the automatic surface level mode.

Alarm: SWITCH POSITION WRONG

NOTE - This message is received when both of the following conditions occur:

- When power switch is off, or a power outage occurs.
- When COMPUTER/MANUAL switch is set in COMPUTER mode.

6. NOTIFY supervision that the message was received.

7. WHEN the power is restored to the FIC, ENSURE that the plummet is at the baseline elevation given in the intrusion baseline table and all switches are set for normal intrusion mode per TABLE 2, page 12, condition 1.

C. RESPOND TO INTRUSION ALARMS (Cont.)

8. VERIFY that the FIC is functioning properly by requesting an OPTION 30 from the CASS operator. Response to the OPTION 30 should be:

   IN. LIQUID LEVEL FOR (Tank I.D.) IS XXXX.XX INCHES (date)(time)

9. IF the SWITCH POSITION WRONG message is printed, PROCEED with the following:

   a. NOTIFY TFSA that the FIC needs to be placed in automatic liquid level mode.

   b. SET COMPUTER/MANUAL switch to COMPUTER.

   c. SET INTRUSION/LIQUID LEVEL switch to LIQUID LEVEL per TABLE 2, page 12, condition 5.

10. CONTACT TFSA AND

    REQUEST that the mode and baseline of the FIC be changed to the automatic level mode.

NOTE - During off shift or weekends TFSA should be contacted at the beginning of day shift.

Alarm: POTENTIAL INTRUSION

NOTE - The message is received when any one of the following sets of conditions occur:

- When an intrusion occurs.
- When POWER switch is off, or a power outage occurs and the COMPUTER/MANUAL switch is set in MANUAL mode.
- When the power is on, the OFF/MANUAL-RISE switch is set in MANUAL-RISE, the COMPUTER/MANUAL switch is set in MANUAL mode, and the INTRUSION/LIQUID LEVEL switch is set in INTRUSION.

- CASS will notify supervision that the message was received.

NOTE - Steps 11, 12, 13 and 14 do not apply during a power outage.

11. ENSURE that power is supplied to the FIC.

12. ENSURE that the POWER switch is ON.

13. ENSURE the plummet is at the baseline.

14. ENSURE that the switches are in the correct intrusion position.

C. RESPOND TO INTRUSION ALARMS (Cont.)

15. VERIFY that the FIC is functioning properly by requesting an OPTION 30 from the CASS operator. Response to the OPTION 30 should be:

    IN. SURFACE LEVEL FOR (Tank I.D.) IS XXXX.XX INCHES
    (date)(time)

16. IF the POTENTIAL INTRUSION message is printed, OBTAIN a manual liquid level reading in the field.

NOTE - If the manual level reading is above the baseline, then a liquid intrusion may have taken place or is currently taking place.

17. WHEN an intrusion occurs, PROCEED with the following:

    a. PLACE the FIC in AUTOMATIC LEVEL mode as described in TABLE 2, page 12, condition 5.

    b. NOTIFY supervision to take immediate action to determine the source of the liquid and stop the intrusion.

18. CONTACT TFSA AND

    REQUEST that the mode and baseline of the FIC be changed to the automatic level mode.

NOTE - During off shift or weekends TFSA should be contacted at the beginning of day shift.

19. IF readings exceed the listed surface level criteria, RECHECK the readings.

    a. REPORT "Confirmed Discrepancies" to supervision.

    NOTE - the following areas shall be notified by supervision:

    - Tank Farm Surveillance and Analysis (TFSA)
    - Tank Farm Operations (TFO)
    - Tank Farm Plant Engineering (TFPE)

    b. RECORD the action taken on the LIQUID LEVEL DATA SHEET.

TABLE 2 - SWITCH POSITIONS FOR INTRUSION MODE FIC'S

CONDITION	ON-OFF	OFF-MAN-RISE	OPERATION	BOB BUTTOM (S-4)	MODE
1. Normal operation.	ON	OFF	MANUAL	N/A	INTRUSION
2. Raise plummet.	ON	MAN-RISE	MANUAL	N/A	LIQUID LEVEL
3. Lower.	ON	OFF	MANUAL	N/A	LIQUID LEVEL
4. Plummet will immediately rise.	ON	MAN-RISE	MANUAL	DEPRESSED	LIQUID LEVEL
5. Return to liquid level monitoring function.	ON	OFF	COMPUTER	N/A	LIQUID LEVEL

D. PERFORM ROUTINE LIQUID LEVEL MONITORING

Monitor Frequency and Procure Data

NOTE - The CASS printouts (routine - 0700, 1500, and 2300) shall be used for routine surveillance per TO-040-020.

- Field readings will only be made under the following conditions:

  - At the frequencies stated in SD-WM-TI-357, or on Double Shell Tanks and Receiver Tanks at the same frequency as normal surveillance readings per the appropriate DATA SHEET, or at increased frequencies as specified by supervision.

  - During periods of CASS outage.

  - As otherwise requested by Tank Farm Surveillance and Analysis (TFSA) and instructed by supervision.

1. IF supervision requests that an FIC be turned off between field readings, POSITION the plummet approximately 4" above the waste between field readings.

2. WHEN FIC or manual tape readings are taken in the field, OBTAIN a reading according to one of the following:

   - At the frequency specified in SD-WM-TI-357.
   - On Double Shell Tanks and Receiver Tanks at the same frequency as normal surveillance readings per the appropriate DATA SHEET.
   - AT increased frequencies as specified by supervision.

3. RECORD on the appropriate Data Sheet.

4. IF readings are not obtainable on an FIC for a single shell tank, NOTIFY supervision to immediately request maintenance assistance.

5. IF an FIC is placed in automatic level mode due to a confirmed intrusion, TAKE a manual reading with that FIC once per shift UNTIL problem is resolved and FIC has been returned to INTRUSION mode.

6. FOR automatic FIC FICs not connected to CASS (identified as MF in Option 32 and 33 listings), CONTINUE to take field readings at frequencies stated in SD-WM-TI-357.

D. PERFORM ROUTINE LIQUID LEVEL MONITORING (Cont.)

7. IF the data recorded by CASS is suspect or exceeds stated criteria, RECHECK liquid level readings.

   a. REPORT confirmed discrepancies to TFSS, TFO, and TFPE immediately.

   b. RECORD the action on the DATA SHEET.

8. TAKE MANUAL measurements in Interim Stabilized and Interim Isolated tanks at frequency stated in SD-WM-TI-357.

9. TAKE manual measurements even if the tank has an automatic liquid level or intrusion mode FIC.

10. WHEN two consecutive readings agree, RECORD the value to the nearest 0.05 inches on the DATA SHEET.

NOTE - All automatic surface level FICs are equipped with the automatic bob feature.

- The FICs automatically break and re-establish the plummet-surface level contact at approximately one minute intervals. Thus, consecutive readings are displayed at this time interval.

11. WHEN consecutive readings are displayed, PRESS the BOB switch to obtain immediate cycling of the plummet.

12. CHECK FIC's not reading the correct value or bobbing improperly.

   a. PLACE switch S-2 to MANUAL-RAISE.

   b. PLACE switch S-3 to MANUAL.

   c. WHEN the tape has come up 4-inches, PLACE S-2 in OFF.

   d. PLACE switch S-3 to COMPUTER

   e. CHECK that the guage reading returns to the same reading.

13. IF any FICs are not functioning, NOTIFY supervision.

14. RECORD data on the LIQUID LEVEL DATA SHEET.

15. FOR single-shell tanks, COMPARE the current reading with the previous day's readings, and with the leak detection criteria listed in SD-WM-TI-357.

D. PERFORM ROUTINE LIQUID LEVEL MONITORING (Cont.)

WARNING

If liquid level is 6 in. Or less in 241-SY, AN, AW, and AP tanks, do not operate ventilation system.

Maintain the maximum liquid or froth level in 241-AY and AZ tanks below 370 in.

Limit - *OSR 11.5 PRIMARY TANK MINIMUM LIQUID LEVEL* *MINIMUM: 6 in.*

Limit - *OSR 11.13 MAXIMUM LIQUID LEVEL* *MAXIMUM: 370 in.*

16. FOR Double-Shell tanks, PERFORM the following:

    a. COMPARE the current reading with the previous day's readings.

    b. INITIAL DATA SHEET upon completion.

17. RETURN the DATA SHEET to supervision.

NOTE - Supervision will initial the data sheet after review and approval.

18. IF the data recorded by CASS is suspect or exceeds stated criteria, PERFORM the following:

    a. RECHECK liquid level readings.

    b. REPORT confirmed discrepancies to TFSS, TFO, and TFPE immediately.

    c. RECORD the action taken on the DATA SHEET.

E. RESPOND TO A TOTAL LOSS OF CASS SERVICES

NOTE - A description of and requirements for operator response to CASS routine liquid level reports are in TO-040-020.

- Total failure of the CASS computers will result in the loss of all routine liquid level and alarm reports. Refer to SD-WM-TI-357 for appropriate action.

Loss Of CASS Services

1. REQUEST the most current listing (prior to the outage) of tanks having FICs connected to CASS.

NOTE - These listings, which are obtained by Options 32 (200-E Area Tanks) and 33 (200-W Area Tanks), shall be routinely procured by the CASS operator each 12-8 shift and retained until the following 12-8 shift.

2. OBTAIN field surface level readings for tank having automatic level FICs once-per-shift or as directed by TFSA or supervision.

3. IF FICs are not connected to CASS (identified as MF in the Option 32 and 33 listings), CONTINUE to obtain field readings at the frequencies stated in SD-WM-TI-357

4. RECORD the data on the LIQUID LEVEL DATA SHEET.

5. COMPARE the current reading with the previous day shift reading and with the leak detection criteria listed in SD-WM-TI-357.

6. INITIAL the DATA SHEET upon completion.

7. RETURN the DATA SHEET to supervision.

NOTE - Supervision will initial the data sheet after review and approval.

8. IF the data recorded by CASS is suspect or exceeds stated criteria, PERFORM the following:

   a. RECHECK liquid level readings.

   b. REPORT confirmed discrepancies to TFSA, TFO, and TFPE immediately.

   c. RECORD the action on the DATA SHEET.

F. CLEAN TAPE AND PLUMMET

1. IF an FIC radiation level reading of 5 mR/hr or greater (above background) is observed, NOTIFY TFPE.

NOTE - TFSS is responsible for scheduling tape and plummet flushes on a need basis.

- Tapes and plummets located in tanks designated as confirmed or suspect leakers shall not be flushed without the specific authorization of supervision and TFPE.

2. REFER to TO-020-420 to clean the tape and plummet.

G. CORRECT ERRORS ON ROBERTSHAW LIT MODEL 185A

NOTE - The controls for the Robertshaw LIT are located locally at the 241-S-304 Catch Tank.

- An error condition is indicated on the LIT by an error message stated on the LED.

Error 1

NOTE - An error associated with the optical shaft encoder has been detected and the level measurement is no longer valid.

1. TO clear Error 1, PERFORM the following:

a. MOVE RAISE/NORMAL/LOWER switch to the RAISE position and allow the tape to rise up a few inches.

b. RETURN the switch back to the NORMAL position and allow the LIT to reset itself.

c. IF LIT continues to show Error 1, GO TO STEP G.2.f.

Error 2

NOTE - Error 2 is associated with the tape movement. The tape either has not moved or has moved in the wrong direction relative to the stepper motor commands.

2. CLEAR Error 2.

a. MOVE selector switch to HIGH-LIMIT.

b. PUSH the select button for the number to be changed.

c. PUSH the UP or DOWN buttons to change the number to 1,487.00.

d. AFTER the number has been set, PRESS the ENTER button.

G. CORRECT ERRORS ON ROBERTSHAW MODEL 185A LIT (Cont.)

e. MOVE selector switch to RUN-LEVEL position.

NOTE - Approx. 720.00 in. (60 ft. of tape) should be showing.

f. MOVE the FAST/STOP/SLOW switch to the FAST position and the RAISE/NORMAL/LOWER switch to the RAISE position.

NOTE - Tape should now start to rise at a fast rate.

g. MONITOR sight glass UNTIL the plummet is seen in the sight glass.

h. MOVE the FAST/STOP/SLOW switch to the STOP position.

CAUTION

Plummet must not be in the way when closing Ball Valve or dammage could occur to the plummet.

i. CLOSE Ball Valve MV-C-1-8 below Robertshaw LIT (refer to FIGURE 3).

j. MOVE selector switch to SETUP.

k. PRESS the SELECT button UNTIL ENCOD is on the LED.

l. PRESS the ENTER button.

m. MOVE selector switch to LEVEL-CAL.

n. POSITION the FAST/STOP/SLOW switch in the SLOW position and the RAISE/NORMAL/LOWER switch in the NORMAL position.

NOTE - THE LIT should lower to the top of the ball valve and stop.

G. CORRECT ERRORS ON ROBERTSHAW MODEL 185A LIT (Cont.)

o. IF plummet falls to the side, MANUALLY raise and lower plummet as follows UNTIL plummet is on top of the ball valve:

1) IF plummet needs to be raised, POSITION the RAISE/NORMAL/LOWER switch in the RAISE position UNTIL the plummet is in the desired position.

2) IF plummet needs to be lowered, POSITION the RAISE/NORMAL/LOWER switch in the LOWER position UNTIL the plummet is in the desired position.

3) WHEN plummet is in the desired position, POSITION the FAST/STOP/SLOW in the STOP position and the RAISE/NORMAL/LOWER switch in the NORMAL position.

p. MOVE the selector switch to the CAL-ENTRY position.

q. PRESS the ENTER button.

r. MOVE the selector switch to the LEVEL-CAL positon.

s. PRESS the SELECT button.

t. PRESS the UP and DOWN buttons to enter 482.07.

u. PRESS the ENTER button.

v. OPEN the Ball Valve MV-C-1-8 to allow the plummet to automatically lower.

NOTE - The plummet should stop when either it touches the bottom of the tank (approx. 0.0 in.) or when it reaches the liquid level (approx. the last reading).

w. IF the plummet does not lower or Error 2 does not clear, NOTIFY supervision.

NOTE - An instrument tech. may be needed to assist in performing this task.

x. MOVE the selector switch to the RUN-LEVEL position.

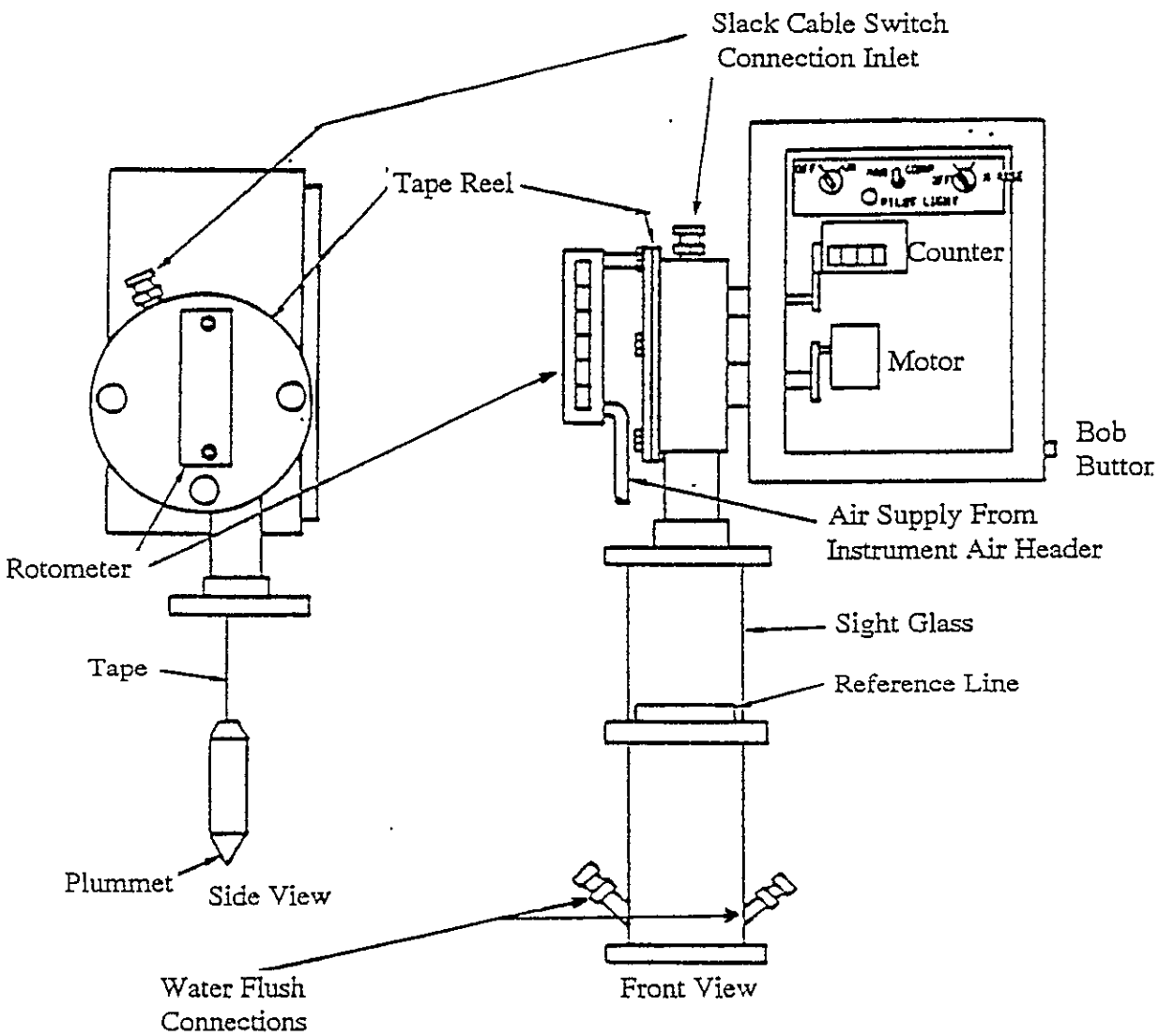

FIGURE 1 - AUTOMATIC FIC SCHEMATIC

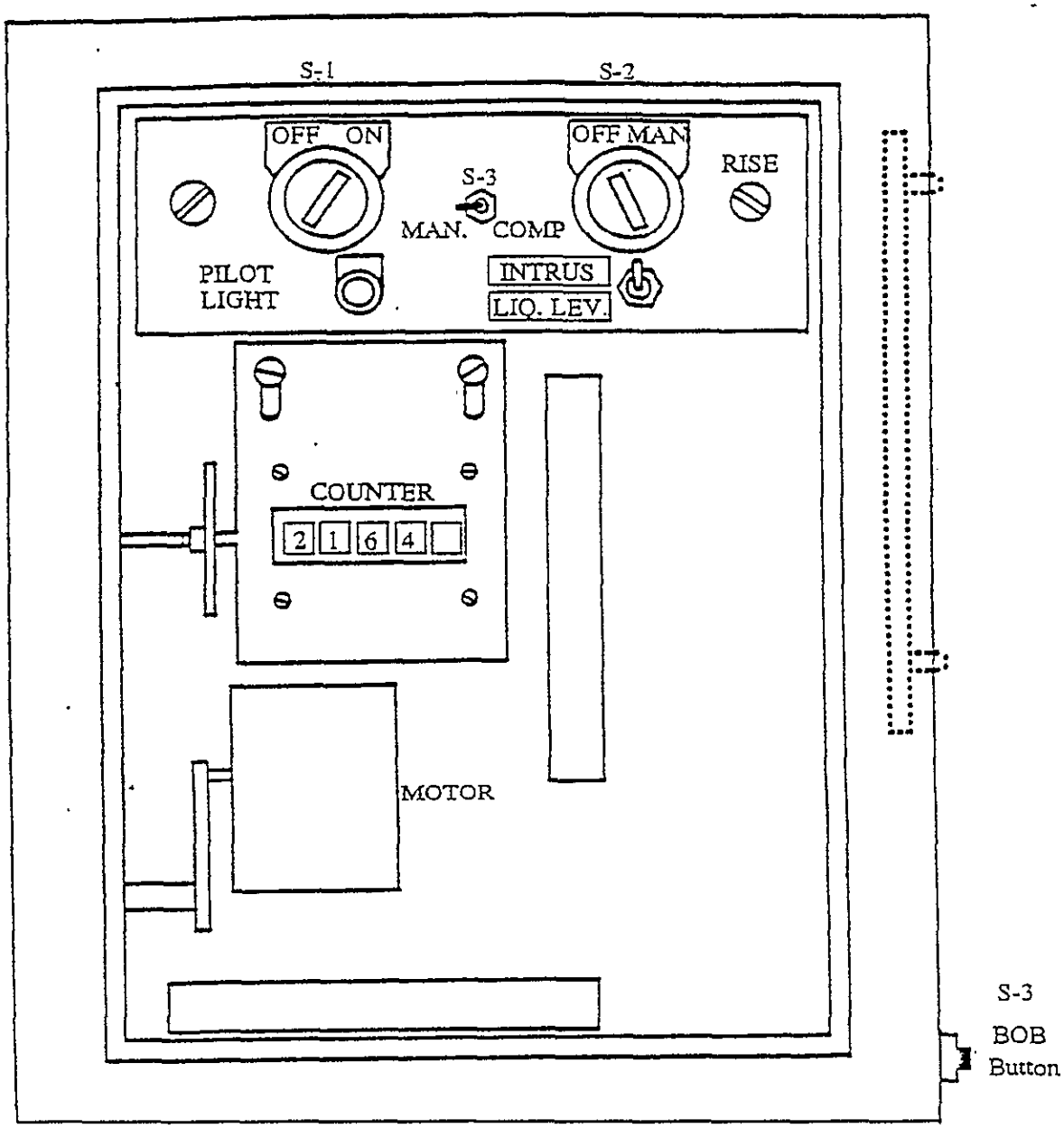

FIGURE 2 - INTRUSION FIC (FACE ONLY)

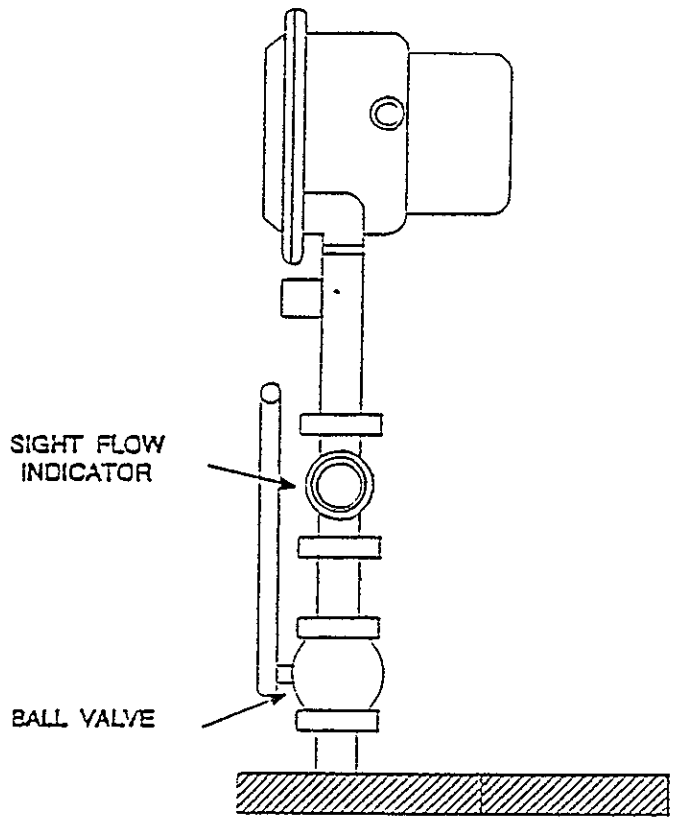

FIGURE 3 - ROBERTSHAW LIT EQUIPMENT SETUP

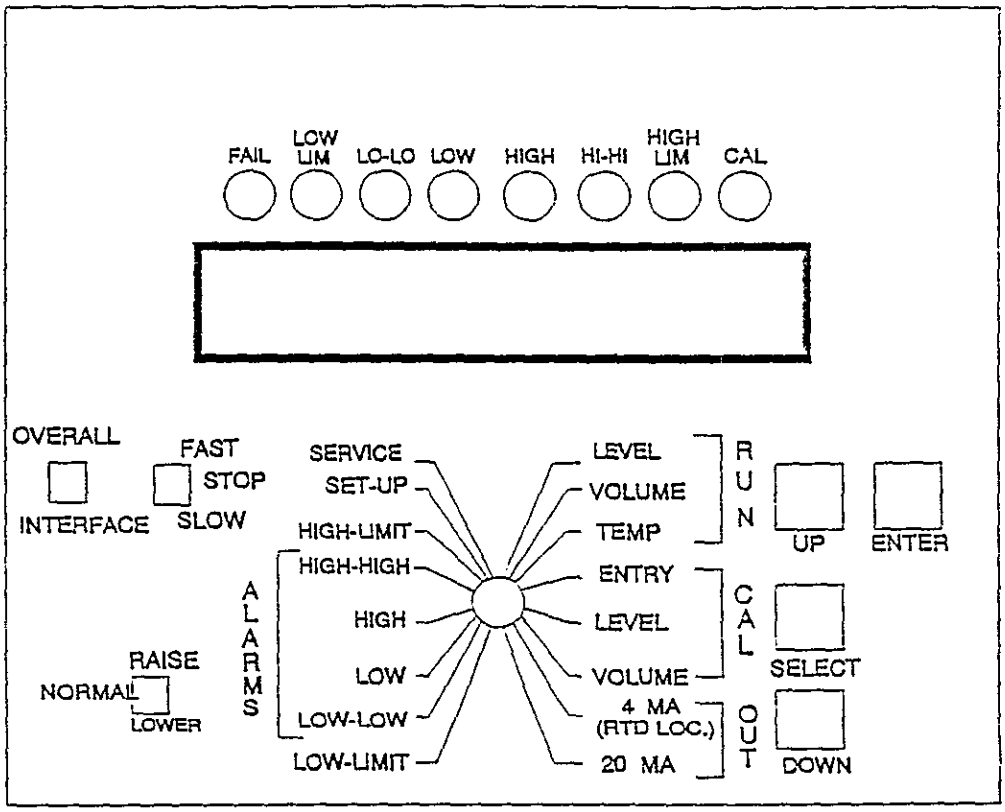

FIGURE 4 - ROBERTSHAW LIT MODEL 185A CONTROL PANEL